

**ABSTRACT OF THE DISCLOSURE**

A method for maintaining the mode-locked state of a Fabry-Perot (FP) laser and a WDM light source using the same method for use in WDM optical communication are disclosed. The mode-locked state can be maintained irrespective of temperature change,  
5 without use of a temperature controller, by spectrum-slicing the incoherent light generated by a light source element and injecting the spectrum-sliced light to the FP laser, then the FP laser amplifies and outputs only a lasing mode coinciding with the wavelength of the injected light, wherein a lasing-mode interval of the FP laser is set to be less than a 3dB linewidth of the injected light, so that at least one lasing mode exists inside the 3dB  
10 linewidth of the injected light irrespective of changes in external temperature.